3.2 Non-Technical Abstract

Approximately 170,000 new cases of lung cancer are diagnosed each year. The overall five-year survival rate for lung cancer is 14%. As current treatments do not significantly impact patient survival, the development of new therapeutic approaches including novel treatments based on our understanding of the molecular biology of this disease are needed. Immunotherapy represents one of the potential new treatments for lung cancer, including non-small cell lung cancer (NSCLC).

The purpose of this study is to see if we can safely immunize against cancer proteins found in NSCLC using a biologic product called the L523S DNA-Adenovirus Immunotherapeutic Vaccine. In particular, we are trying to generate an immune response against the L523S protein, which is highly expressed in lung carcinomas. The L523S DNA-Adenovirus Immunotherapeutic Vaccine contains two components: 1) plasmid DNA containing the L523S gene (pVAX/L523S) and 2) a recombinant Adenovirus-5 containing the L523S gene (Ad/L523S). The pVAX/L523S DNA is a piece of DNA purified from bacteria that contains the gene for the L523S protein. The Ad/L523S is a laboratory-modified form of adenovirus that has been engineered to contain the gene for the L523S protein. This virus is replication-deficient, which means it cannot grow in the human body.

The plasmid DNA (pVAX/L523S) is designed to initiate and stimulate an immune response to the L523S protein. Ad/L523S, expressing the L523S immunogenic protein, will be used to expand and enhance the effectiveness of pVAX/L523S administration. The pVAX/L523S and Ad/L523S are separate components that are designed to have different functions in the proposed therapeutic application.

Cancer patients will initially receive two intramuscular (IM) injections of pVAX/L523S at the beginning of the study and two weeks later. The pVAX/L523S injections will be performed using a needle-free delivery system called the Biojector® 2000. Two weeks after completion of the pVAX/L523S injections, patients will also receive injections of Ad/L523S by IM injection using a standard syringe and needle and again four weeks after that. Groups of patients will receive increasing doses of Ad/L523S. Because of this, the first patients to be treated in this study will receive lower doses of Ad/L523S than the later patients, watching for side effects to be sure that it is safe to give the higher doses. We believe, based on laboratory experiments, that the use of this vaccine could result in the production of immune substances (antibodies and T cells) that recognize non-small cell lung cancer cells.